



US Army Corps
of Engineers

Engineer Research and
Development Center

Fact Sheet

Topographic Engineering Center, 7701 Telegraph Road, Alexandria, VA 22315-3864, <http://www.tec.army.mil>

Rapid Terrain Visualization-Advanced Concept Technology Demonstration (RTV-ACTD)

Description and Background: In May 1995, the Army Deputy Chief of Staff for Intelligence briefed the Chief of Staff of the Army (CSA) on battlefield visualization, the state-of-the-art and the potential utility for Force XXI. As a result of the briefing, the CSA recommended the development of a supporting ACTD. The Joint Precision Strike Demonstration Project Office (JPSD-PO) was directed to develop this ACTD and it was approved as a 5-year program with an FY97 start.

Objective: *Demonstrate the technologies and infrastructure to meet the Army requirement for rapid generation of digital topographic data to support emerging crisis or contingencies.*

The RTV ACTD is demonstrating a contingency capability for rapid collection of high-resolution (level III-V) digital topographic elevation data with Interferometric Synthetic Aperture Radar (IFSAR) and Light Detection and Ranging (LIDAR) sensors on a de Havilland DHC-7 aircraft. Processing of the IFSAR data will be accomplished in real time on-board the aircraft. A fine-resolution SAR image, orthorectified with the elevation data, will provide a 3-D image map with very high geo-spatial accuracy. In a parallel effort an integrated software package has been developed on ground-based workstations for rapid, semi-automated extraction and attribution of key topographic features. Feature data is generated from multi-spectral imagery; IFSAR and LIDAR data collected by commercial and government sensor systems. Evaluations of the military utility of RTV ACTD technologies are being conducted with soldiers of the XVIII Airborne Corps, Fort Bragg, NC and the 555th Engineer Company (Topographic), III Corps, Fort Hood, TX. Technologies proven to have high military utility will be provided to XVIII Airborne Corps and III Corps as leave-behinds in FY00 and supported through FY01. The RTV Team has installed prototype software at both Fort Bragg and Fort Hood after successful evaluation by soldiers and OPTEC personnel in the JPSD Integration and Evaluation Center. ATEC will conduct a final assessment of RTV data utility during the JCF AWE in FY00.

RTV ACTD CONCEPT

Key Events: Supported numerous training exercises and AWEs with high-resolution data and data generation software including Task Force XXI, the DIV XXI AWE and the JCF-AWE. Procured DHC-7 aircraft through the Army "Trade-A-Plane" program at no cost to the ACTD. Modified the aircraft to accommodate LIDAR and IFSAR sensor systems. Integrated and demonstrated a LIDAR sensor to obtain level V (1m) elevation data. Completed design and fabrication of a multi-baseline IFSAR sensor to collect level III (10m) and IV (3m) data. IFSAR system is currently undergoing test flights and will be fully operational in FY00. Developed RTV Data Generation Software for rapid, semi-automated generation of terrain feature data from multi-spectral imagery (MSI). The software ingests imagery and existing map data, assists the operator in extracting features, and exports new / updated topographic data sets. Output is in standard formats for use in Army Battle Command Systems and the Digital Topographic Support System to support terrain analysis, map background displays, battlefield visualization, and simulations. The software is modularized and runs on UNIX workstations. Version 4.0 of the software is installed at Fort Bragg and Fort Hood. A final upgrade is scheduled in early FY01.

DATA GENERATION SOFTWARE

The Digital Topographic Support System (DTSS) is the terrain node for ABCS. In a cooperative effort with Project Director, Combat Terrain Information Systems, RTV has developed a strategy to transition RTV software to the DTSS-

Base. Developed a strategy for operation of the sensors to collect high-resolution elevation data after completion of the ACTD and options for transition to a UAV platform in the far term.

RTV DATA COLLECTION SYSTEM

Schedule: The RTV ACTD was initiated in FY97 and will be completed at the end of FY01. The high level schedule is shown below. Development and integration activities will be completed in FY00 with support provided to XIII Airborne Corps and III Corps units in FY01.

RTV ACTD SCHEDULE

Point of Contact:

- Technical Manager:
 - Mr. Chris Moscoso, Deputy Director, JPSD, Fort Belvoir, VA
(703) 704-1966, christian.moscoso@nvl.army.mil
 - COL Kenneth Dobeck at
703/704-1943, kenneth.dobeck@nvl.army.mil

- Operational Manager: COL Greg Bean, Deputy Director, MSBL, Fort Leonard Wood, MO
(573) 563-4082, beang@wood.army.mil
- User: COL (P) Rick Zahner, G2, XVIII Abn Corps, Fort Bragg, NC
(910) 396-3209, zahner@bragg.army.mil